



TECHNOLOGY DEVELOPMENT THROUGH INDUSTRIAL PARTNERSHIPS

INTRODUCTION

Office of Science and Technology

The Department of Energy's (DOE) Environmental Management (EM) Office of Science and Technology (OST) manages an aggressive national program for applied research, development, demonstration, testing, and evaluation (RDDT&E). This program develops high-payoff technologies to clean up the inventory of DOE nuclear component manufacturing sites and to manage DOE-generated waste faster, safer, and cheaper than currently available environmental cleanup technologies. The primary goal is to protect human health and prevent further contamination.

The RDDT&E sponsored by OST is designed to make new, innovative, and more cost effective technologies available for transfer to DOE environmental restoration and waste management end-users. EM has divided its technology development program into Focus Areas and Crosscutting Technologies, which represent its highest priorities.

The Focus Areas are:

- Mixed Waste
- High Level Waste Tank Remediation
- Subsurface Contaminants
- Decontamination and Decommissioning

The Crosscutting Areas are:

- Characterization, Monitoring, and Sensor Technologies (CMST)
- Efficient Separations and Processing (ESP)
- Robotics

One of OST's strategies is to ensure that private industry, other Federal agencies, universities, and DOE National Laboratories are major participants in developing and deploying new and emerging technologies. This is accomplished through substantial funding set aside for building public and private-sector partnerships. To enhance opportunities for technology commercialization, OST seeks partnerships with private-sector companies during the technology development and demonstration phases. Industry partners will facilitate

implementing these emerging technologies to solve the nation's environmental problems.

As technology development matures, decisions for the continuation of OST RDDT&E projects are based on technology-investment decision methodology. This incorporates seven stages of technology maturation, from basic research through implementation and corresponding decision points (or "gates") at which projects are selected for funding. At each gate, projects are evaluated against technical, regulatory, economic, and institutional criteria to assure that the end products will provide superior performance and meet the acceptance requirements of the customers in the DOE user community. Figure 1 shows the seven stages of technology maturation and the corresponding gates.

Tools employed to select and implement RDDT&E projects include: Program Research and Development Announcements (PRDAs), Research Opportunity Announcements (ROAs), Cooperative Research and Development Agreements, Financial Assistance Awards, Interagency

Figure 1 - Technology Maturation Stages and Gates

	Basic Research	Applied Research	Exploratory Development	Advanced Development	Engineering Development	Demonstration	Implementation
Technology Maturation Stages	Idea Generation No Need Need		Proof of Technology Product definition Working model • Non-specific applications • Reduction to practice • Bench-scale • Specific applications • Bench-scale		Engineering Prototype • Scaled-up version to test design features and performance limits • Pilot-scale • Field testing	Production Prototype • End-user validation • Full-scale • "Beta" site testing	Utilization by end-user
Gate Expectations	1 Address priority DOE need Knowledge of similar efforts		2 Show clear advantage over available technology	3 Meet cost/benefit requirements Demonstrate significant end-user demand	4 Technology ready for end-user	5 End-user deploys technology	6



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INTRODUCTION

Agreements, and DOE National Laboratory Technical Task Plans. Of these various tools, the PRDAs and ROAs are administered for OST through the Morgantown Energy Technology Center (METC).

Morgantown Energy Technology Center

METC, located in Morgantown, West Virginia, is a program implementation office that supports the DOE Offices of Fossil Energy, Environmental Management, and Energy Efficiency. METC, using the full R&D resource base of the country (industry, universities, national laboratories, and other research entities), carries out a function with a national scope analogous to those of the combined DOE field offices and National Laboratories.

METC is a government-owned and operated entity with Federal personnel having full delegated procurement authority to enter into contracts and assistance agreements on behalf of DOE, including the negotiation of patent and data rights which are important elements in many of the cost-shared R&D agreements that are the heart of the Fossil Energy Program.

Complementing this procurement function is METC's project management function for projects selected under the PRDAs and ROAs. The 85 projects presented in this document are managed by METC's technical staff of scientists and engineers.

Each project is phased, with go/no-go decisions keyed to the OST RDDT&E gates. Accordingly, most projects have a base contract period followed by option periods correlating to process scale-up and demonstration decisions.

To facilitate effective RDDT&E, the OST projects managed by METC are industrial entities that can commercialize new products. The industrial partners use government funding to conduct RDDT&E, enabling them to achieve earlier market entry than would be possible under company-funded only development.

To date, METC has conducted five major solicitations -- two PRDAs, which solicit proposals for specific areas of need, and three ROAs, which solicit proposals in more broad areas of need. METC procurement and technical personnel work directly with the individual focus and crosscutting areas to define needs, select solicitation mechanisms, conduct peer-review of proposals, and select projects for award. METC has solicited two PRDAs for EM. The first, in the area of groundwater and fossil technologies, resulted in twenty-one contract awards to private sector and university technology developers. The second PRDA solicited novel decontamination and decommissioning technologies and resulted in sixteen contract awards.

METC has solicited three ROAs for EM: ROA-I in March 1993, ROA-II in April

1994, and ROA-III issued on April 30, 1996. The ROAs, which are open for one year, solicit research in a broad range of EM-related topics, including in-situ remediation; characterization, sensors, and monitoring technologies; efficient separations technologies; mixed waste treatment technologies; and robotics.

Of the projects selected under the PRDAs and ROAs, a substantial portion have gone to small business technology developers. These Technology Development Data Sheets describe the technology development projects being conducted for OST under the METC-sponsored/administered PRDAs and ROAs.

The Technology Development Data Sheets in this package are organized (and tabbed) by Focus Area:

- Mixed Waste
- High Level Waste Tank Remediation
- Subsurface Contaminants
- Decontamination and Decommissioning

These Technology Development Data Sheets can also be found on the METC Homepage along with other important information on the METC Programs. URL: www.metc.doe.gov/research/ewm.html

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TECHNOLOGY DEVELOPMENT THROUGH INDUSTRIAL PARTNERSHIPS

TABLE OF CONTENTS

Contractor	Project Title	Page
 MIXED WASTE FOCUS AREA		
Aerojet General Corporation	Platelet-Cooled Plasma Arc Torch	1
Bio-Imaging Research, Inc.	Waste Inspection Tomography (WIT)	3
Bio-Imaging Research, Inc.	Non-Destructive Examination and Assay of	5
	Drums Containing Transuranic Waste	
Delphi Research, Inc.	Development Studies for a Novel Wet Oxidation	7
	Process	
Eichrom Industry	Novel Silica-Based Ion-Exchange Resin	9
Laser Diagnostics	A Continuous Emission Monitor for Toxic	11
	Metals in the Off-Gases of Thermal Treatment	
	Facilities	
Lockheed Martin	Intelligent Mobile Sensor System (IMSS) For Autonomous	13
	Monitoring & Inspection	
Lockheed Martin	Automated Baseline Change Detection (ABCD)	15
Membrane Technology	Membrane System for Recovery of Volatile	17
Research, Inc.	Organic Compounds from Remediation Off-Gases	
Mercury Recovery Services	Removal and Recovery of Mercury from Mixed	19
	Wastes	
Mirage Systems, Inc.	Mixed Waste Treatment Using the ChemChar Thermolytic	21
	Detoxification Technique	
Molten Metals Technology, Inc.	Catalytic Extraction Processing of Contaminated	23
	Scrap Metal	
Rust Federal Services, Inc.	VAC*TRAX - Mobile Vacuum/Thermal Treatment	25
	System	
Rust Federal Services, Inc.	Nitrate to Ammonia and Ceramic (NAC) Bench Scale	27
	Stabilization Studies	
South Carolina Universities	An Intelligent Inspection and Survey Robot	29
Research and Education		
Foundation		
Thermochem, Inc.	Steam Reforming of Low-Level Mixed Waste	31
Vortec Corporation	Research and Development of an Innovative Fossil	33
	Fuel Fired Vitrification Technology	





TECHNOLOGY DEVELOPMENT THROUGH INDUSTRIAL PARTNERSHIPS

TABLE OF CONTENTS

Contractor	Project Title	Page
WASTREN, Inc.	Evaluation of Electrodialysis - Ion Exchange for the Separation of Dissolved Salts	35
TANKS FOCUS AREA		
EIC Laboratories	Field Raman Spectrograph for Environmental Analysis	37
LSR Technologies, Inc.	Liquid Membrane System for Removal and Concentration of Transuranic Elements	39
Oceaneering Space Systems, Inc.	Robotic End Effector for Inspection of Storage Tanks	41
Science&Engineering Associates, Inc.	Automated Monitoring System for Fluid Level and Density in High-Level Waste Tanks	43
Westinghouse Science and Technology	An Advanced, Open-Path Atmospheric Pollution Monitor for Large Areas	45
SUBSURFACE CONTAMINANT FOCUS AREA		
Amerasia	Field Portable Detection of VOCs Using a SAW/GC System	47
Applied Research Associates	Measuring Fuel Contamination Using High Speed GC and Cone Penetration Techniques	49
Applied Research Associates	Tomographic Site Characterization Using CPT, ERT and GPR	51
ARCTECH, Inc.	Development of Humasorb™, A Lignite Derived Humic Acid for Removal of Metals and Organics	53
Atomic Energy of Canada, Inc.	Soil Treatment to Remove Uranium and Related Mixed Radioactive Heavy Metal Contamination	55
Babcock & Wilcox, Inc.	Development of a Long-Term, Post-Closure Radiation Monitor	57
Babcock & Wilcox, Inc.	In Situ Tritium Beta Detector	59





TECHNOLOGY DEVELOPMENT THROUGH INDUSTRIAL PARTNERSHIPS

TABLE OF CONTENTS

Contractor	Project Title	Page
Coleman Research Corporation	Geophysical Data Fusion for Subsurface Imaging	61
Engineering Computer Optecnomics	Road Transportable Analytical Laboratory (RTAL)	63
Environmental Research Institute of Michigan	Imaging Data for Hazardous Waste Applications	65
General Electric Corporate R & D Center	Organic Sponges for Cost Effective CVOC	67
Geophex, Ltd.	Abatement Geophex Airborne Unmanned Survey System	69
Halliburton NUS	(GAUSS) Soil Saw Demonstration	71
Intera, Inc.	In-Situ Decontamination of Aquifers by Surfactant	73
K&M Engineering & Consulting Corp.	Solubilization of DNAPL's Circulating Air Barrier (CAB) System	75
Microsensor Systems	Miniature GC for In-Situ Monitoring of Volatile	77
Mirage Systems, Inc.	Organic Compounds Within a Cone Penetrometer Three Dimensional Sub-Surface Imaging Synthetic	79
Monsanto Co.	Aperture Radar Development of an Integrated In-Situ Remediation	81
New Mexico Institute of Mining & Technology	Technology Surface Altered Zeolytes as a Permeable Barrier	83
Physical Optics Corporation	Integrated Optics Chemical Sensor for Simultaneous	85
Science & Engineering Associates, Inc.	Detection & Quantification of Multiple Ions Barometric Pumping with a Twist	87
Science & Engineering Associates, Inc.	Fiber Optic/Cone Penetrometer System for	89
Science & Engineering Associates, Inc.	Subsurface Heavy Metals Detection In Situ Permeability Measurements	91
Science & Engineering Associates, Inc.	with Direct Push Techniques Subsurface Barrier Validation with the SEAttrace™	93
South Carolina Universities Research and Education Foundation	Monitoring System Management of Municipal Solid Waste Technology	95
	RD&D ("Waste Technology Center")	





TECHNOLOGY DEVELOPMENT THROUGH INDUSTRIAL PARTNERSHIPS

TABLE OF CONTENTS

Contractor	Project Title	Page
South Carolina Universities Research and Education Foundation	Measurement of Radionuclides Using Ion Chromatography and Flow-Cell Scintillation Counting	97
Stevens Institute of Technology	Stabilization and Reuse of Heavy Metal Contaminated Soil by Means of Quicklime-Sulfate	99
Thermo Power Corp. (Tecogen Division)	Development of an On-Line, Real-Time Alpha Radiation Measuring Instrument for Liquid	101
Transducer Research, Inc.	Field-Usable Portable Analyzer for Chlorinated Organic Compounds	103
University of Arizona	High-Resolution Subsurface Imaging & Neural Network Recognition	105
University of Vermont	Alcohol Flushing for Removing DNAPLs from Clay and Sand Layered Aquifer Systems	107
UTD, Inc.	Innovative Directional and Position Specific Sampling Technique	109
UTD, Inc.	A Steerable Distance Enhanced Penetrometer Delivery System	111
Weiss Associates	Acoustically Enhanced Remediation of Contaminated Soil and Groundwater	113

DECONTAMINATION AND DECOMMISSIONING FOCUS AREA



Arrey Industries	Phoenix	115
Babcock & Wilcox, Inc.	Decontamination of Process Equipment Using Recyclable Chelating Solvent	117
Carnegie Mellon University	Mobile Worksystem for Decontamination & Decommissioning	119
Carnegie Mellon University	Asbestos Pipe-Insulation Removal System	121
Carnegie Mellon University	Operator Interface for Robotic Applications	123
Coleman Research Corporation	Three Dimensional Integrated Characterization and Archiving System (3D-ICAS)	125
Coleman Research Corporation	Coherent Laser Vision System (CLVS)	127





TECHNOLOGY DEVELOPMENT THROUGH INDUSTRIAL PARTNERSHIPS

TABLE OF CONTENTS

Contractor	Project Title	Page
Department of the Army	Task Order - Chicago Pile 5 Decommissioning Project	129
Dow Environmental, Inc.	Decontamination and Recycle of Concrete	131
F2 Associates	Laser Surface Cleaning	133
General Electric Corporate R & D Center	Rapid Surface Sampling and Archive Record (RSSAR) System	135
International Union of Operating Engineers	Human Factors Assessment of Environmental Technology	137
ISOTRON® Corporation	Electrokinetic Decontamination of Concrete	139
KAI Technologies	Electromagnetic Mixed-Waste Processing System for Asbestos Decontamination	141
Lockheed Martin	Multisensor Inspection & Characterization Robot for Small Pipes (MICROSPI)	143
Manufacturing Sciences Corporation	Advanced Technologies for Decontamination and Conversion of Scrap Metal	145
Mechanical Technology, Inc.	Interactive Computer-Enhanced Remote Viewing System	147
Mechanical Technology, Inc.	Diagnostics And Data Fusion of Robotic Sensors	149
Membrane Technology & Research Inc.	Protective Clothing Based on Permselective Membrane and Carbon Adsorption	151
NeuTek	High-Sensitivity Monitor for Radionuclides	153
Oceaneering Space Systems, Inc.	Advanced Worker Protection System (AWPS)	155
Oceaneering Technologies, Inc.	Remote Operated Vehicle Dry Ice Pellet Decontamination System	157
Physical Sciences, Inc.	Portable Sensor for Hazardous Waste	159
Redzone Robotics, Inc.	Houdini: Reconfigurable In-Tank Robot	161
Science & Engineering Associates, Inc.	Characterization of Radioactive Contamination Inside Pipes with the Pipe Explorer™ System	163
SRI International	Novel Mass Spectrometric Instrument for Gaseous and Particulate Characterization	165
Textron Defense Systems, Inc.	Concrete Decontamination by Electro-Hydraulic Scabbling	167
Westinghouse Electric Corporation	Treatability Study Using Prompt Gamma Neutron Activation Analysis (PGNAA) Technology	169

